

Inter (Part-II) 2021

Biology	Group-I	PAPER: II
Time: 2.40 Hours	(SUBJECTIVE TYPE)	Marks: 68

SECTION-I

2. Write short answers to any EIGHT (8) questions: (16)

(i) Differentiate between hydrophytes and mesophytes.

Ans Differences between hydrophytes and mesophytes:

Hydrophytes	Mesophytes
1. Hydrophytes have the adaptations to remove the flooding of its cells in freshwater.	1. Mesophytes have moderate water availability.
2. The surface area of leaves is very large to transpire water excessively.	2. In sufficient supply of water, stomata are kept open to promote loss of excess water.
3. Extensive stomata are present on the upper surface to promote loss of water.	3. In restricted supply of water, stomata close to prevent the loss.

(ii) What are osmoconformers and osmoregulators animals?

Ans Animal body fluids are kept isotonic to the external environment even for marine saltwater environment. These animals thus do not require actively to adjust their internal osmotic state, so are known as **osmoconformers**.

The animals whose body fluid concentrations differ noticeably the outside environment actively regulate to discharge excess water in hypotonic and excrete salts in hypertonic conditions, therefore, are called as **osmoregulators**.

(iii) How vasodilation differ from vasoconstriction?

Ans Differences between vasodilation and vasoconstriction:

Vasodilation	Vasoconstriction
1. In vasodilation, skin blood vessels dilate.	1. In vasoconstriction, skin blood vessels constrict.
2. Capillaries fill with warm blood.	2. Blood diverts from skin to deeper tissues.
3. Heat radiates from skin surface.	3. Heat loss is reduced from skin surface.

(iv) Define ecdysis or moulting, give its two stages.

Ans The animal, therefore, needs to shed its exoskeleton periodically and replace it with one of the larger size. This process is known as "ecdysis or moulting."

Ecdysis is divided into four stages; Here are two stages:

1. Enzymes, secreted from hypodermal glands, begin digesting the old endocuticle. This digestion separates hypodermis and the exoskeleton.
2. The digestion of endocuticle is followed by secretion of new procuticle and epicuticle.

(v) Differentiate between troponin and tropomyosin.

Ans Differences between troponin and tropomyosin:

Troponin	Tropomyosin
1. The major protein in thin filament is troponin.	1. A protein related to myosin, involving in muscle contraction, is tropomyosin.
2. It binds to calcium ions, moving tropomyosin away from the myosin-binding sites on actin filaments.	2. It covers the myosin-binding sites on the actin filament in a relaxed muscle, preventing contraction.

(vi) Give two functions of skeletal system.

Ans Following are two functions of skeletal muscles:

- (i) Bones support soft tissues and serve as attachment sites for most muscles and provide shape to the body.
- (ii) Bones protect critical internal organs, such as brain, spinal cord, heart and lungs.

(vii) Define seed dormancy. Write its two significance.

Ans Seed Dormancy:

It is the special condition of rest, which enables an embryo to survive the long periods of unfavourable environmental conditions, such as water scarcity or low temperature. During this period of rest, the embryo ceases or limits its growth.

Significance:

1. This is of great survival importance of the plant in that it prevents the dormant seed from germinating in response to conditions such as a warm spell in winter, which, although apparently favourable, are only temporary.
2. Germination or resumption of normal growth by a dormant embryo requires certain, very precise combinations of environmental cues, to avoid any accidental stimulus which may prove fatal later on.

(viii) Define oviparous and viviparous animals.

Ans In terrestrial conditions, fertilization is internal. Sperms are lodged in the female body where fertilization occurs. This may lead to external development as in reptiles and birds. They lay shelled eggs to protect the developing embryo from harsh terrestrial conditions. Such animals are called **oviparous**.

In mammals, internal fertilization leads to internal development and development of embryo is accomplished inside the female body, which gives birth to young one. Such animals are called **viviparous**.

(ix) What is profundal zone?

Ans In profundal zone, light is insufficient to support photosynthesis. The organisms of this zone are mainly nourished by detritus that falls from the littoral and limnetic zone and by incoming sediment. Decomposers and detritus feeders, such as, snails and certain insect larvae, bacteria, fungi and fishes, inhabit it.

(x) How many biomes are present in the World? Name any four of them.

Ans Biomes:

Major types of ecosystems, those that occupy broad geographical regions are called **biomes**.

There are seven biomes in the world, four of which are as follows:

1. Tundra
2. Grassland
3. Desert
4. Rainforest

(xi) Differentiate between deforestation and reforestation.

Ans Deforestation

Clearance of vast areas of forest for procuring lumber, planting subsistence crops or grazing cattle is called deforestation.

Reforestation

Reforestation is the replantation of trees. It is important for many conifer species which require bare soil to establish.

(xii) Define eutrophication. Give its one effect upon animal life.

Ans The natural process of excessive enrichment of water with nutrients by which large amount of living organic matter grows in water. The nitrates and phosphates are added in the water where they decompose by the activity of bacteria.

Vast quantities of algae feed and reproduce on these nutrients causing the water to turn green with algal boom. The dead algae are decomposed by aerobic bacteria, which deplete the water oxygen content, causing death of aquatic animals through lack of oxygen. It occurs in freshwater and in seawater, both developing unpleasant color and smell.

3. Write short answers to any EIGHT (8) questions: (16)

(i) Differentiate between kinesis and taxis.

Ans Differences between kinesis and taxis:

Kinesis	Taxis
1. Kinesis is random and undirected motion.	1. Taxis is specific type of motion that is directed.
2. Kinesis is random motion from a source of stimulus.	2. Taxis is towards or away from the source of stimulus.
3. This type of motion is observed in euglena or humans, etc.	3. This type of motion is observed in lice or beetle, etc.

(ii) Write the role of progesterone.

Ans Progesterone:

Produced by the ruptured follicle in response to LH from the pituitary. Progesterone inhibits further FSH secretion from the pituitary, thus preventing any more follicles from ripening. It also affects the uterus, causing further thickening and vascularization of its wall, and other areas of the female body, preparing it for maintaining the state of pregnancy. It suppresses ovulation. That is why, it is a major constituent of birth control pill.

(iii) What is Addison's disease?

Ans The destruction of the adrenal cortex, such as occurs in Addison's disease, will lead to general metabolic disturbance, in particular weakness of muscle action and loss of salts. Stress situations, such as cold, which would normally be overcome, lead to collapse and death.

(iv) What is gene and its locus?

Ans Gene is the basic unit of biological information. In fact, DNA stores all sorts of biological information coded in the sequence of its bases in a linear order, and genes are actually parts of DNA comprising its base sequences. The position of a gene on the chromosome is called its **locus**.

(v) What is dihybrid cross?

Ans "Dihybrid cross is the cross between two different genes that differ in two observed traits."

In a dihybrid cross, the parents carry different pair of alleles for each trait. One parent carries homozygous dominant allele, while the other one carries homozygous recessive allele. The offsprings produced after the crosses in the F₁ generation are all heterozygous for specific traits.

(vi) Write dominant and recessive trait.

Ans The trait that first appears or is visibly expressed in the organism is called the **dominant trait**.

The trait that is present at the gene level but is masked is called the **recessive trait**.

(vii) What are three possible ways to get a gene?

Ans There are three possible ways to get the gene of interest:

- (a) to isolate it from the chromosome,
- (b) to synthesize it chemically, and
- (c) to make it from mRNA.

(viii) Write the role of Lambda phage as a vector.

Ans Besides plasmids, the DNA of bacterial viruses (for example, lambda phage) can also be used as a vector. After lambda phage attaches to a host bacterium, recombinant DNA is released from the virus and enters the bacterium. Here, it will direct the reproduction of many more viruses. Each virus in bacteriophage clone contains a copy of the gene being cloned.

(ix) Write any two uses of PCR.

Ans Following are two uses of PCR:

1. It can withstand high temperature, which is used to separate double stranded DNA, therefore, replication need not be interrupted by the need to add more enzyme.
2. PCR is done these days in an automatic PCR machine or thermocycler, which is a routine piece of equipment in any laboratory.

(x) What is Niche, explain according to Charles Elton?

Ans Charles Elton considered the niche, the basic role of an organism in the community what it does in and for living community, its relationship to its food and enemies. In other word, he defined the niche as the species's occupation.

(xi) What are decomposers?

Ans **Decomposers** are mainly the fungi and bacteria, which obtain their energy from the dead and decaying plants and animals. They release chemical elements as ions. The main chemical ions are nitrates, ammonia, phosphates, potassium and calcium.

(xii) Write crustose lichens in xerosere.

Ans A crust is any external protective surface and crustose means crusts on the substratum. Special types of lichens get impregnated in the form of crust. They can live in extreme conditions. Sometimes, their surface is wet due to rain and

dewdrops. They absorb water during dry season. They are quiescent or dormant, normally desiccated during dry season.

4. Write short answers to any SIX (6) questions: (12)

(i) Define growth and development.

Ans Growth:

Growth is the permanent and irreversible increase in size that occurs as an organism matures.

Development:

The progressive changes which are undergone before an organism acquires its adult form constitute embryonic development.

(ii) Define teratogens. Give two examples.

Ans Environmental factors causing or contributing to abnormal development are grouped together as teratogens. Ionizing radiations (e.g., X rays) are well-known for their teratogenic action. Because, they often have their effect on the developing ovum or spermatozoan, causing damage or changes (mutations) in the genes. Nutritional deficiencies, absence of certain substances (e.g., vitamins and trace elements), toxins and drugs even ingested by mother, effect the differentiation of every tissue in the foetus. If such deficiency is high, a cell may cause death of foetus.

(iii) Draw structural formula of nucleotide.

Ans Structural formula of a nucleotide:

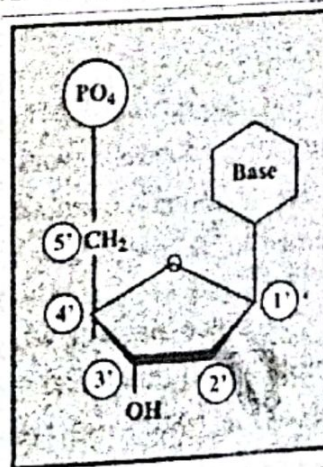


Fig. Numbering the carbon atoms in a nucleotide.

(iv) Differentiate between leading strand and lagging strand.

Ans Difference between leading and lagging strand:

Leading strand	Lagging strand
1. Leading strand elongates towards the replication fork.	1. Lagging strand elongates away from the replication fork.
2. It is built up simply by adding nucleotides continuously to its growing 3' end.	2. It is synthesized discontinuously as a series of short segments that are later connected.

(v) Define transformation. In which bacterium it was discovered?

Ans Transformation is the transfer of genetic material from one cell to another and can alter the genetic make up of the recipient cell.

It was first discovered in a bacterium, *Streptococcus pneumoniae*.

(vi) What are cancer cells? How cancer cells can be distinguished from normal cells?

Ans The cells composing a malignant tumor or cancer, divide more rapidly, mostly invade surrounding tissues, get into the body's circulatory system, and set up areas of proliferation, away from their site of original appearance. This spread of tumor cells and establishment of secondary areas of growth is called as **metastasis**.

Cancer cells can be distinguished from normal cells because they are less differentiated than normal cells, they exhibit the characteristics of rapidly growing cells *i.e.*, high nucleus to cytoplasm ratio, prominent nucleoli and many mitosis. The presence of invading cells in otherwise normal tissue is an indication of malignancy.

(vii) What is meant by non-disjunction? Write its consequences.

Ans Meiosis is an orderly occurring phenomenon, which ensures every phase with appropriate finish, but sometimes, at any point the result may be unexpected, causing abnormalities. One of such abnormalities is chromosome non-disjunction, in which chromosomes fail to segregate during anaphase and telophase

and do not finish with equal distribution of chromosome among all the daughter nuclei. This results either increase or decrease the number of chromosomes, causing serious physical, social and mental disorders. This non-disjunction may be in autosome or in sex chromosome.

(viii) Differentiate between homologous and analogous organs.

Ans Difference between homologous and analogous organs:

Homologous organs	Analogous organs
Homologous organs are functionally different but structurally alike. Forelimbs of man, bat, horse, whale, etc.	Analogous organs are functionally alike but structurally different. Wings of bat, birds, insects, etc.

(ix) How the oxygen accumulation liberated during photosynthesis changed the environment of Earth?

Ans Oxygen accumulation liberated during photosynthesis likely oxidized atmospheric methane (a strong greenhouse gas) to carbon dioxide (a weaker one) and water. This weakened the greenhouse effect of the Earth's atmosphere, causing planetary cooling, which has been proposed to have triggered a series of ice ages known as the Huronian glaciation, bracketing an age range of 1.45 - 2.22 billion years ago.

SECTION-II

NOTE: Attempt any Three (3) questions.

Q.5.(a) Give the homeostatic roles of liver in the form of a table. (4)

Ans Major homeostatic function of the liver

Functions	Major effects on homeostasis
Synthesis: Nitrogenous wastes: NH_3 , urea, uric acid	Supports kidney in waste disposal
Plasma proteins: like (a) prothrombin, fibrinogen (b) albumin etc.	(a) Blood clotting (b) maintain osmotic balance of blood.
Bile	Emulsifies fats in small intestine.
Lipids, cholesterol, lipoproteins	Regulate blood chemistry, store energy and help to maintain cell membranes

Storage: Iron	Oxygenation of tissues as constituent of haemoglobin
Glycogen	Energy reserves
Conversion: Excess glucose in blood to glycogen, lactic acid to glycogen and stored glycogen to glucose.	Energy storage and use
Recycling: Contents of old red blood cells (e.g., iron and other constituents of haemoglobin)	Oxygenation of tissue
Detoxification: Many harmful chemicals (e.g., food additives, pesticides, drugs, etc.)	Assist kidney in toxin disposal

(b) Define ecosystem. Discuss its components and their interaction. (4)

Ans **Ecosystem:**

The major unit of ecology is the ecosystem. Organisms interact with their environment within the confines of the ecosystem. The **eco** part of the word is related to the environment and the **system** part means a collection of related parts that function as a unit. The ecosystem consists of two basic interacting components, the **living** or biotic, and the physical or abiotic factors.

Biotic components consist of animals, plants, fungi, micro-organisms, etc. and a-biotic components are atmosphere, climate, soil, and water.

The various kinds of organisms that inhabit an ecosystem make up populations.

Population is a group of interbreeding individuals (same species) occurring together in space and time. Populations of plants and animals in the ecosystem do not function independently of each other. Some populations compete with other populations for resources, such as food, water, or space. In some cases, one population is the food resource for another. Two populations may mutually benefit each other. All populations within an ecosystem are known as a **community** and are in one or another manner interconnected to one another.

The ecosystem has many levels. On our level, individual organism, including man, both respond to and influence the physical environment. At the next level, individuals of the same species form population, that can be described in terms of number, growth rate, and age distribution. Further, individuals of these populations interact among themselves and with individuals of other species to form a community.

Major types of ecosystems, those that occupy broad geographical regions are called biomes. Each biome consists of a combination of plants and animals in the fully developed climax community, and is characterized by a uniform life, form of vegetation such as grass or coniferous trees. Combined the biome of Earth together form the planetary ecosystem.

Q.6.(a) Write down four phases in the repair process of a fracture. (1,3)

Ans A fracture is treated by **reduction** followed by **realignment** of the broken bone ends. There are two types of reduction: closed and open reduction. In closed reduction, the bone end is coaxed back to their normal position by physician's hand. In open reduction, surgery is performed and the bone ends are secured together with pins or wires. After broken bone is reduced, it is immobilized by a cast or by traction to allow the healing process to begin. Healing time is 8-12 weeks, but it is much longer for large weight -- bearing bones and for bones of elderly people (because of their poorer blood circulation).

The repair process of a simple fracture takes place in four phases:

1. Hematoma Formation:

When a bone breaks, the blood vessels in the bone itself, and perhaps in surrounding are torn resulting hemorrhage. As a result, a hematoma, a mass of clotted blood, forms at the fracture site. Soon after, bone cell deprived of food begin to die and the tissue at the fracture site becomes swollen and hence painful.

2. Callus Formation:

Next "soft callus" begins to form in 3-4 weeks. Capillaries grow into the hematoma and clear up the debris. Fibroblasts and osteoblasts migrate into the fracture site and begin to construct bone.

3. Bony Callus Formation:

Osteoblasts and osteoclasts continue to migrate inward, multiply rapidly and gradually convert the soft callus into bony callus. Bone formation begins 3-4 weeks after injury and continuous until a firm bony union is formed within 2-3 months later.

4. Remodeling:

After several months, bony callus is remodeled by the excess material on the outside of the bone. Final structure of remodeled area resembles that of the original unbroken bone because it responds to the same set of mechanical stimuli.

(b) Write a note on genetic code.

(4)

Ans Genetic Code:

Genetic code is a combination of 3 nucleotides, which specific a particular amino acid. There are three nucleotides in a codon, because a two nucleotide codon would not yield enough combinations to code for the 20 different amino acids that commonly occur in proteins. With four DNA nucleotides (G, C, T and A) only 4^2 or 16, different pairs of nucleotides could be formed. However, these same nucleotides can be arranged in 4^3 or 64 different combinations of three, more than enough to code for the 20 amino acids. The genetic code is a triplet code and the reading occurs continuously without punctuation between the three nucleotide units.

After Crick's initial experiments, Marshall Nirenberg, Philip Leader and Har Gobind Khorana tested all the 64 codons by making artificial mRNAs and triplet codons and using them to synthesize a protein or aminoacyl-tRNA complexes in cell-free systems.

The full genetic code was determined during mid-60s. Out of 64 codons, three codons UAA, UAG and UGA do not code for any amino acid and hence are known as nonsense codons. These codons are usually present at the end of the gene and hence are also called stop codons. Every gene starts with initiation codon AUG, which encodes the amino acid methionine.

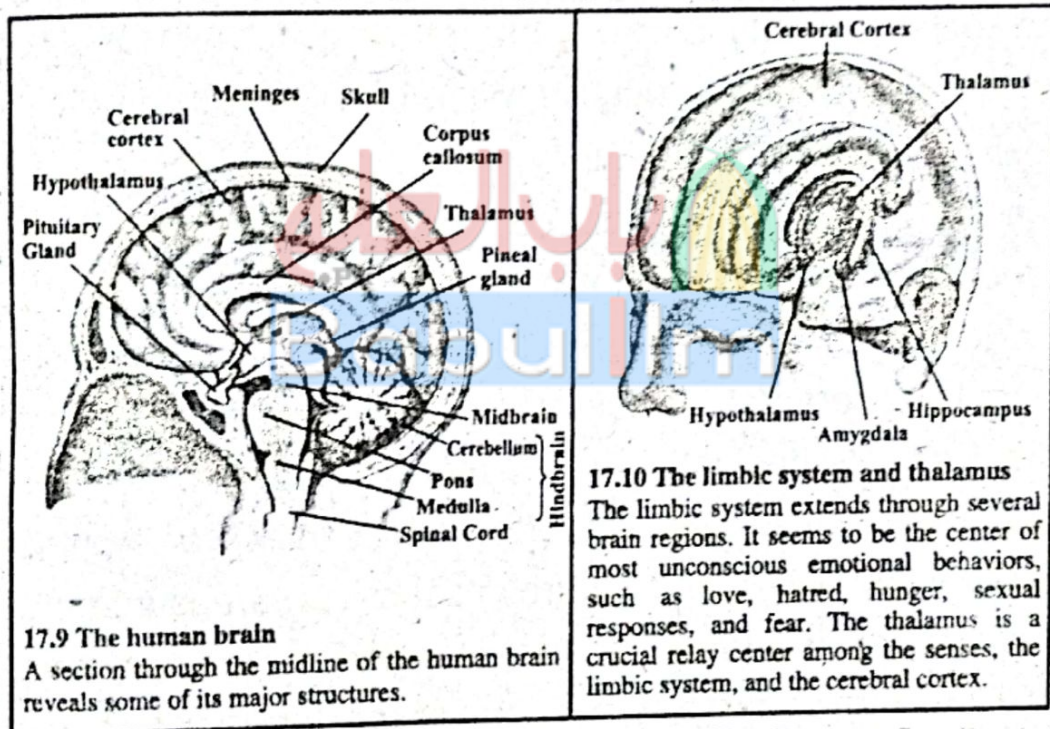
The genetic code is universal. It is the same in almost all the organisms. For example, AGA specifies arginine in bacteria, in humans and all other organisms whose genetic code has been studied. Because of the universality of codon, the genes

can be transferred from one organism to another and be successfully transcribed and translated in their new host.

The study of genetic code of mitochondrial DNA however, showed the genetic code is not that universal. For example, UGA condon is normally a stop condon but in mitochondria it reads as tryptophan. Likewise, AUA was read as methionine instead of isoleucine and AGA and AGG for termination of protein synthesis is instead of arginine. Thus it appears that genetic code is not quite universal.

Q.7.(a) Explain structure and function of forebrain in man. (4)

Ans The brain can be divided into forebrain, midbrain and hindbrain. Forebrain is further divided into three functional parts, the thalamus, the limbic system (Fig.) and the cerebrum. Thalamus carries sensory information to the limbic system and cerebrum. The information includes sensory input from auditory and visual pathways, from the skin and from within the body.



The limbic system is located in an arc between the thalamus and cerebrum. Limbic system works together to produce our most basic and primitive emotions, drives, and behaviours, including fear, rage, tranquillity, hunger, thirst, pleasure and sexual responses. Portion of limbic system is also important in the formation of memories. The limbic system

consists of hypothalamus, the amygdala, and hippocampus, as well as nearby regions of cerebrum. The hypothalamus through its hormone production and neural connections acts as a major coordinating centre controlling body temperature, hunger, the menstrual cycle, water balance, the sleep-wake cycle, etc.

In the amygdala, clusters of neurons produce sensation of pleasure, punishment or sexual arousal when stimulated. It is also involved in the feelings of fear and rage.

Hippocampus plays an important role in the formation of long-term memory, and thus is required for learning. Cerebrum is the largest part of the brain and is divided into two halves, called cerebral hemispheres. These halves communicate with each other by means of a large band of axons, called corpus callosum. Tens of billions of neurons are packed into this part. The outer region, the cerebral cortex, forms folds called convolutions, which greatly increase its surface area. This part receives sensory information, processes it, stores some in memory for future use, directs voluntary movements, and is responsible for the poorly understood process that we call thinking.

The cerebral cortex contains primary sensory areas where signals originating in sensory organs such as eyes and ears are received and converted into subjective impressions, such as light and sound. Nearby association areas interpret this information. This area is also involved in speech and also receives and interprets sensations of touch from all parts of the body. This area is also a centre for sending impulses to voluntary muscles, controlling movements. This is also involved in intelligence, reasoning and judgment.

The left cerebral hemisphere controls the right side of the body, and right cerebral hemisphere controls the left side of the body.

(b) Write a note on algal bloom or eutrophication. (4)

Ans This is the natural process of excessive enrichment of water with nutrients by which large amount of living organic matter grows in the water. Lakes slowly develop large concentrations of aquatic plant life, which eventually decays. Human activities have speeded up this natural process of eutrophication by adding mineral and organic nutrients in larger quantities than nature would provide, as excreta, phosphates from washing powder and nitrates and phosphates from fertilizers. Vast quantities of algae feed and reproduce on these nutrients causing the water to turn green with algal boom. The dead algae are decomposed by aerobic bacteria, which deplete the water oxygen content, causing death of aquatic animals through lack of oxygen. It occurs in freshwater and in seawater, both developing unpleasant color and smell.

Q.8.(a) Write a note on identical twins and fraternal twins. (4)

Ans **Identical Twins:**

In higher vertebrates including man, zygote after fertilization, undergoes cleavage (cell division by mitosis). When embryo is at two celled stage, the two blastomeres, instead of remaining together, may separate and behave as two independent zygotes, each giving rise to a new individual. Both the organisms are products of mitosis, thus they have identical genetic make up and are called identical twins. They are produced mitotically (asexually).

Fraternal Twins:

In some cases, more than one egg is produced by the female and all these eggs are independently fertilized forming two or more zygote. These zygotes develop into new offsprings, but with different genetic combinations. Such a twins or

triplets are called fraternal twins or triplets. They are produced sexually.

(b) Write a note on diabetes mellitus. (4)

Ans In general, insulin depresses blood glucose levels, in a variety of ways which include increasing glycogen synthesis and increasing cell utilization of glucose. It also stimulates conversion of glucose into lipid and protein, which in turn reduce glucose levels. Insulin inhibits the hydrolysis of glycogen in the liver and the muscles. Failure to produce insulin leads to a condition called **diabetes mellitus**. The symptoms of this are high level of blood sugar, sugar in the urine, a disturbance of the body's osmotic equilibrium and derangement of the nervous system. Toxic metabolites from fat (which need 'glucose energy' for their oxidation) also accumulate and are only lost from the kidney with valuable metal cations. The body becomes dehydrated. If excess insulin is produced, the utilization of sugar is too great and its level falls in the blood (hypoglycaemia) which upsets nerve and muscle functioning.

Glucagon is essentially antagonistic to insulin and causes an increase in blood glucose levels. It does this mainly by promoting breakdown of glycogen to glucose in the liver and muscles. It also increases the rate of breakdown of fats.

Glucagon abnormalities seem rare as endocrine disorders. Tumors on the β cells will cause excess glucagon secretions and consequently high blood glucose levels. This in turn damages the β cells with the results described above.

Q.9.(a) Describe the types of meristems. (4)

Ans In lower plants, the entire plant body is capable of growing, but in higher plants, the entire plant body is not capable of growing but growth is limited to certain regions known as growing points. These growing points consist of

groups of cells which are capable of division, these growing points are called **meristems**. These meristematic cells are located at the stem and root and they are of the following types:

(i) Apical Meristems:

The apical meristems are found at the tips of roots and shoot and are primarily concerned with the extension of plant body. These are perpetual growth zones found at the apices of roots and stems. They are responsible for increase in the number of cells at the tips of roots and stem, so they play important role in primary growth.

(ii) Intercalary Meristems:

These are the parts of apical meristem which get separated from apex by permanent tissues. They are situated at the bases of internodes in many plants. They play important role in the production of leaves and flower. These are of temporary nature.

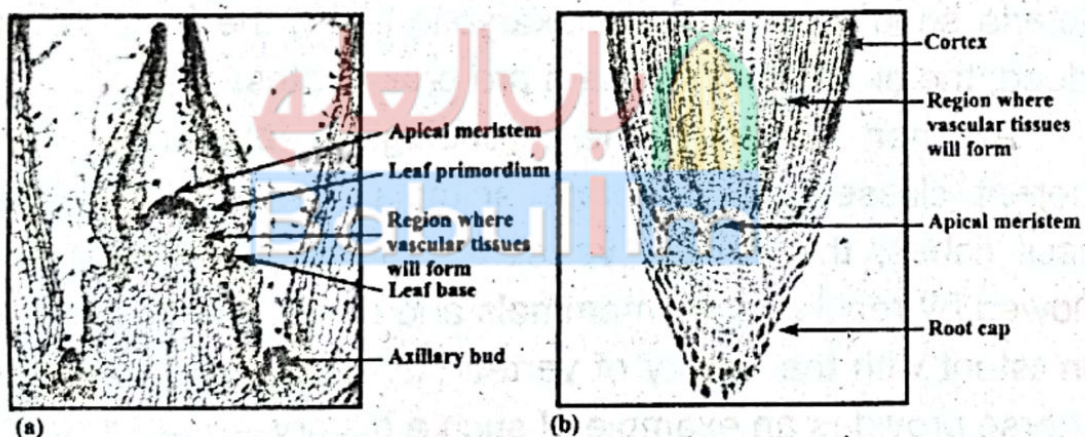


Fig. Photomicrographs of the apex of a shoot (a) and a root (b).

(iii) Lateral Meristems:

Lateral meristems are cylinders of dividing cells. They are present in dicots and gymnosperms. Vascular and cork cambium are the examples of lateral meristem. They play an important role in the increase in diameter of stem and root and in secondary growth are determinate *i.e.*, they grow to certain size and then stop *e.g.*, leaves, flowers and fruits; while others are indeterminate *i.e.*, they grow by meristems that continually replenish themselves, remaining youthful *e.g.*, vegetative root and stem.

(b) Explain the evidences of evolution by fossil record and comparative anatomy. (4)

Ans **Evidences of Evolution:**

Evolution leaves observable signs. Darwin's theory of evolution was mainly based on the evidence from the geographical distribution of species and from the fossil record. However, there have been many evidences as biology progressed. New discoveries, continue to validate the evolutionary view of life. Let us discuss now some of the evidences.

The Fossil Record:

The succession of fossil forms is a strong evidence in favour of evolution. It provides a visual record in a complete series showing the evolution of an organism. For instance, evidence from biochemistry, molecular biology, and cell biology places prokaryotes as the ancestors of all life, and predicts that bacteria should precede all eukaryotic life in the fossil record. Indeed, the oldest known fossils are prokaryotes.

Another example is the chronological appearance of the different classes of vertebrate animals in the fossil record. Fossil fishes, the earliest vertebrates, with amphibians next, followed by reptiles, then mammals and birds. This sequence is consistent with the history of vertebrate descent. The evolution of horse provides an example of such a history.

Comparative Anatomy:

Anatomical similarities between species grouped in the same taxonomic category bring another support to the theory of the Descent with modification. For example, the same skeletal elements make up the forelimbs of human, cats, whales, bats, and all other mammals, although these appendages have very different functions. The basic similarity of these forelimbs is the consequence of the descent of all mammals from a common ancestor. The arms, wings, flippers, and forelegs of different mammals are variations on a common anatomical theme that

has been modified for divergent functions. Similarity in characteristics resulting from common ancestry is known as homology, and such anatomical signs of evolution are called homologous structures. Comparative anatomy supports that evolution is a remodeling process in which ancestral structures that functioned in one capacity become modified as they take on new functions. The flower parts of a flowering plant are homologous. They are considered to have evolved from leaves, to form sepals, petals, stamens and carpels.

The oldest homologous structures are vestigial organs rudimentary structures of marginal, if any, use to the organism. Vestigial organs are historical remnants of structures that had important functions in ancestors but are no longer essential presently. For instance, the skeletons of whales and some snakes retain vestiges of the pelvis and leg bones of walking ancestors, vermiform appendix in carnivores, ear muscles in man, etc.

